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Dr. Whitaker is Head of the Department of Geography, George Peabody College for Teachers. He is joint-author of a high school text in geography and a college text on conservation of natural resources. Dr. Whitaker is one of our eminent leaders in the field of geographic education and has a very broad view of the functions that education should perform for the youth of America. This is the fifth in our series of articles on what secondary school geography should contribute to the education of our youth.

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Dr. Fifield is co-author of the volume "Geopolitics in Principle and Practice," and Assistant Professor of Geography in the University of Missouri where his teaching work is chiefly in the fields of political geography and geopolitics.

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Mr. Warman taught geography for ten years in the Morristown, Pennsylvania school system. He was granted a leave of absence in 1942-43 to accept a fellowship in geography at Clark University, where he has been retained as an Assistant Professor of Geography. During his work there he had an excellent opportunity to ascertain how much geography had been retained from public school instruction, in his teaching of men preparing for military service. His reaction expressed in this article is the product of his many years of experience in the public schools and teaching the product of those schools at the university level. This is the sixth in our series of articles on what secondary school geography should be.

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Miss Conrad is a teacher in the Edgemont School, Scarsdale, New York. She became interested in geography thru Dr. Renner at Columbia University and also thru the Appalachian Mountain Club. This article represents one of the regional studies which she has contributed to the work of that Club.

Conformation of Non-irrigated Desert Occupance to Transport Patterns. By Pfc. Charles W. Johnson 313

Mr. Johnson is in service in an Army band. Prior to his induction he was an instructor in geography in the Lawrenceville, Illinois, Junior High School. He is a graduate of Illinois State Normal at Carbondale, and has done graduate work in geography at the University of Wisconsin.

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Dr. Blanchard of the University of Illinois, is well known to JOURNAL readers and also to teachers thruout the country who have used his texts. As a side line, Dr. Blanchard has gotten a lot of pleasure out of the formulation of interest-stimulating devices. He has provided us with a series and we will publish them in future issues of the JOURNAL. This is the first one in the series. Both teachers and students will find it eminently worth-while to answer the questions which he has raised. It is not our intent to publish a set of answers.

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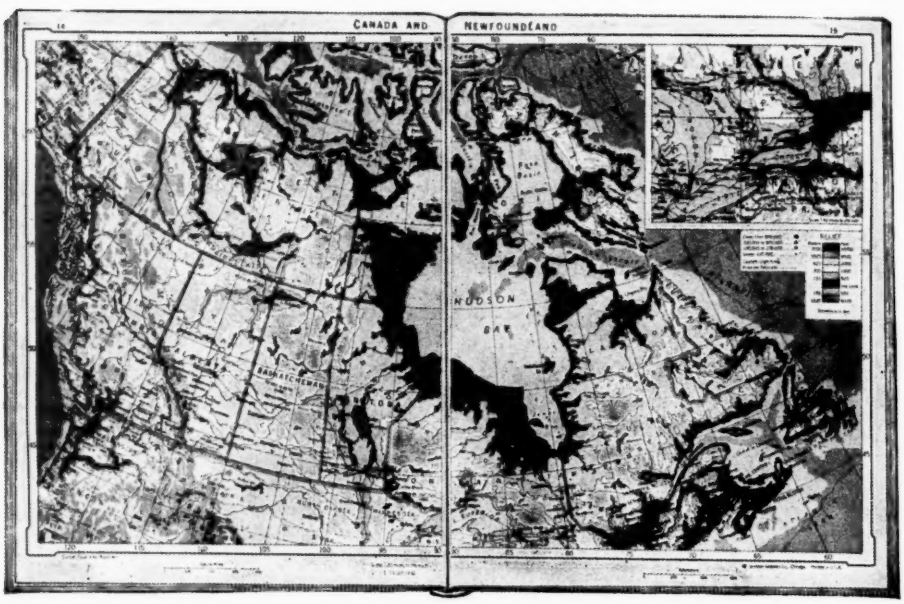
Announcing a New School Atlas for Students!

By L. P. DENOYER



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DESIGN FOR HIGH SCHOOL GEOGRAPHY

J. R. WHITAKER
George Peabody College for Teachers

An army aviation student was sitting on the front row of the class, looking at a large globe. Suddenly he leaned forward and said, in all seriousness, "That globe is wrong. There simply isn't that much of the Pacific Ocean." This was an extreme example of the geographical ignorance of our young men; but it is almost as regrettable to be utterly ignorant of the meaning of latitude and longitude, to have no conception of time belts, or to assume that all map projections portray true areas. Nearly all of the aviation students, all but one or two in each class of forty, had these or similar gaps in their knowledge of geography. The deficiencies shown by these army students contribute to the mounting evidence of need for geographical training in high school.

In meeting the growing demand for geographical instruction in high school, administrators and teachers are faced with many problems, five of which are selected for analysis: (1) the needs which geographical education can satisfy; (2) the minimum content of the basic course, and of courses which might well follow it; (3) how these geography courses best fit into the high school program; (4) the minimum equipment for teaching high school geography; and (5) the qualifications the geography teacher should possess.

NEEDS GEOGRAPHY CAN MEET

What needs justify a basic or general course in high school geography? Geographical instruction provides answers to questions we are asking and will continue to ask; develops ways of thinking which are essential to our life; builds up attitudes which are accepted as basic to the functioning of effective citizenship, whether in terms of state, nation, or the world; and develops needed skills.

Geographical Knowledge. The Second World War has raised thousands of questions which geographers have been called on to answer. We have become concerned as never before about where places are. We need to know the exact location of roads, of towns, and of production areas, and the nature of beachheads and mountain passes. We are concerned with the climate of this place or that. We have a new sense of the value of geographical knowledge.

But the war is a prelude to the peace, and the tasks of war give way to the exacting, tho not so exciting, demands of peace. Both are but phases of the one principal challenge the twentieth century is facing—to work out some effective basis of accord on a world-wide scale. We have steadily enlarged the geographical area over which peace prevails; now we have the task of making that area include all of the inhabited earth. To operate on a world scale obviously requires at least a frame of basic geographic knowledge.

The fund of geographic knowledge is almost limitless. What information is so fundamental to the thinking of the American that it should be taught over and over, be kept a part of his working equipment thruout the school years and afterward? At least this, a knowledge of the location and character of the principal natural and man-made features of the earth—world patterns of populations, occupation, government, climate, land forms, natural resources, and routes of trade or travel. As war has shown, it is impossible, and would be useless if possible, to learn the location of all of the places one needs to think about. But the individual requires a frame of reference for these facts which may be used only for the day. A friend asked for a world map and a large map of Europe. When given an atlas, the reaction was, "This is all well and good, but I just can't see the relation of these different places to others. I need a large map with very little on it." So do we all need a mental map, or better still, an imaginary globe in our minds, one we can turn at will to any position. We must try to meet the requirements of an age of world-wide interrelation with a knowledge of the interrelated areas. An imperative need for knowing about the rest of the world is with us, whether we be inclined to a stand-off attitude or one favoring participation in world affairs.

We not only need a world frame of reference, but a more detailed frame for the country within which we function as citizens.

World-wide knowledge should be matched with more detailed knowledge of the home country, its principal geographical features, both natural and man-made. Moreover, we need geographical data on an even fuller scale for our home state, region, and place. Thus at least three geographic frames of reference should be built up and kept alive by use—a detailed one of the home area and region, a less detailed one for the United States, and an even less detailed one for the world as a whole. Within these frames we can organize the data which come to our attention day by day, which we may not care to retain beyond the requirements of the moment.

Teaching these minimum essentials begins with the stories told to little children; in the early grades we customarily build up a skeletal world frame, and one for our country and perhaps for our state. Ideally, later grades fill in this frame. These mental maps need to be checked for gaps, elaborated, and used in terms of the maturing ideas of high school pupils. Some elemental facts may be learned quite early, such as the location of the Panama Canal; but their significance in human affairs is a question that may yield new truths thruout a lifetime. Too commonly we have stripped geography of its richer meanings in our effort to teach all of it to grade children. Only with more mature young people can we hope to go deeply into the meaning of geography in terms of vital human interests.

Altho a large part of the usefulness of geographical knowledge is realized in its service wherever *location* is an element of significance, it is well to remember that geographic data have many other uses, particularly as they throw light on persisting problems. The driving power behind German geopolitics has taught us to appreciate the force of geographical knowledge when made the instrument of moving purposes; we have seen how effectively geography can carry a share of the program of conservation education. We shall eventually learn that it has light to throw on the regional aspects of housing, food supply, health, and recreation. We already have a genuine appreciation of its relation to the movement of men and goods and ideas over the world.

Ways of Thinking. A wise geography teacher has said that a large part of the facts used in instruction are just so much water to make the wheels of the mind go round. And certainly one of the principal tasks of the geography teacher is to handle the work so that important details drop out of sight when their power is spent.

With all that we can do, however, the basic factual patterns slowly fade unless put to use, in later geography courses, in related work as in history, in free reading in the library, in reading magazines and newspapers. The experienced teacher, knowing what a large loss of factual material occurs with the passing of years, will not only seek for what we call large understandings but will also recognize the need for developing in the pupil the ways of thinking geographers have used. A brief identification of selected aspects of geographic thought will reveal their relation to our current needs.

One of the much needed mental qualities is to think habitually in terms of *location.* A vast portion of human living is tied up with specific places; and, unless an understanding of the place aspect is reached, our grasp of those phases of life is clearly incomplete. The eagerness with which we reached for maps, atlas, or globe, the morning of June 6, 1944, as news of the invasion of Western Europe reached us, illustrates my point. Geographic thinking is thinking in terms of particular places and all that that implies.

"The world is so full of a number of things" that we can think coherently only by some form of simplification. The need for principles of organization grows as our knowledge of the earth expands. Geography presents us with two principles in this connection: the recognition and use of patterns of earth features and of subdivisions of the earth's surface or regions. Instead of thinking of this railroad and that, this airline and that, our grasp of essentials is furthered by working out, say, the rail pattern of the world, or the pattern of air routes. It was a delight to see a group of army aviation students studying a globe on which air routes were mapped. They had been here and there by plane, but not until they examined this globe did they, by their own testimony, put the pieces together in a pattern. Similarly, weather data about different parts of Africa become meaningful when climatic maps are prepared. This phase of geography which is concerned with individual geographical features and their patterns is called systematic or topical geography. It provides concepts about which to organize our thinking, and is concerned with describing and understanding the distribution of these geographical features over the earth. In this kind of study we come to a closer understanding of the entire world, the primary object of geographic concern.

The other principal way to bring order into the mass of data about the whole earth is to think in terms of regions. Each region

may then be studied and our understanding furthered by our single-minded grasp of it. Whether we are planning the improvement of the Mississippi River, the control of erosion on the Great Plains, or a military campaign in the Paris Basin of France, the regional approach is valuable. Most problems of national planning are more effectively handled if this way of thinking about the earth is employed.

Ranking with the values that come from thinking clearly in terms of location on the earth, is another fundamental aspect of geographic thought—our concern with the *natural environment.* Habitually to evaluate current events in terms of the natural environmental setting is one of the fruits of geographic study. This contribution has different facets—the *influence* of weather conditions on English Channel crossings or on the price of wheat, the *relation* of health in the Philippines to air temperatures, the *adjustments* called for in attempting agriculture in an arid or hilly region. A sensitiveness to the possibilities and the liabilities provided by the natural environment is one of the needs that geographic study helps to meet.

Overlapping somewhat with this appreciation of the natural environment is a larger concern in what geographers call *relationships.* Without a recognition of how each place is related to others, location on the earth becomes a barren study. Consideration of relationships runs thru all geography, but two aspects are selected here for special emphasis: the relation of man to place conditions, particularly to the natural environment, and the interrelation of places and people. In encouraging students to think in terms of man-nature relationships, we do not stop with the identification and interpretation of such relations. We are also concerned with passing judgment on them. Is this the kind of land use which conservation dictates? One of the principal values in this kind of thinking is the habit of rising to the challenge present in the whole problem of conservation of natural resources. A study of the interrelations of places and people likewise leads on to the problem of preserving peaceful relations, safeguarding those interregional and international connections which make for good will and well-being.

Growing out of the relation of various geographic features on the earth is another fundamental in the geographic approach to world understanding—the principle of world unity. For the geog-

rapher, the entire earth is one unit, the one object of his study. Whether he be concerned with the circulation of winds, the movement of peoples, or world trade in wheat, he must recognize, sooner or later, the unity of the earth. This habit of thinking in world terms is surely an essential of our life today. Just to give one supporting point: we say much about our growing independence of the limitations of our local environment, as man has advanced from savagery to civilization; and it is true that as time goes on, man is less and less limited by the conditions of the place where he lives. On the other hand, as this freedom has grown, he has become more and more subject to world limitations. The farmer in the Great Plains, for example, can have a variety of foods, even tho the climate permits few crops to be grown; but in selling his wheat to obtain these articles which cannot be grown locally, he must seek distant markets where he competes with wheat regions scattered around the world, and where he is made keenly aware of the limitations of the world market.

Desirable Attitudes. In acquiring basic knowledge of the geographic features of the world and in learning to think about the world in the ways just discussed, the geography student is almost certain to acquire new attitudes. Among the many attitudes which are furthered by effective geography teaching is a sympathetic understanding of other peoples. Distant peoples and places become more real, their problems more clearly understood, their achievements appreciated, and our relations with them more clearly evident. Whether it be in our relations with people in other parts of our state, our nation, or in foreign areas, sympathy and good will, based on understanding, are apparently prerequisites to a peaceful solution of our differences and to co-operation in our attack on common problems.

Geographic Literacy. Secondary education should meet the need for geographic literacy. As our educational system is set up in the schools, it is largely based on reading, and a major part of the education which goes on in the post-school years is thru reading. In reading materials which have geographic quality, the student is concerned with words and sentences, with maps, with graphs, and with photographs. Understanding what one reads requires a grasp of many geographic concepts and the ability to get behind a map to the ideas which it conveys, to get the meaning out of graphs, and to analyze photographs in terms of the basic ways of thinking

outlined above. We know that the average graduate of the elementary grades is far from having the desired competence. Here geography teachers have an opportunity to contribute to the end which the American Council of Education placed at the head of the list of contributions which the high school should make to general education—to make pupils competent readers.

Content and Organization of High School Geography

In view of the attention given to the continents in grade geography and the need for participating in an evolving world community, the basic high school course should be one in *world* geography. Nothing less than an enlarged understanding of the entire inhabited earth should be the goal. For each age there is a desirable geographic orientation: for the ancient Egyptians, an understanding of the Nile Valley sufficed; and the early Greeks were largely concerned with the Mediterranean Sea and connecting straits and seas; but today we require a world view in order to understand many matters of deep concern to us. Ideally, the world view will have been begun early in the schooling of the individual pupil, and ideally this world view will persist thruout the period of formal education. In the high school we need to fill in, to check up, and to secure a firmer grasp of the world pattern; we need to use whatever understandings have been built up before; we need to clarify our world geography as a basis for world history; and we need this world view for renewed study at a higher level of our home region and country. The urgent necessity of world understanding on a mature level is surely evident to all.

Human Geography. This course in world geography should be human (or cultural) geography from beginning to end. Man, man in place on earth, should be kept in the foreground thruout the study. To say that the course should be one in human geography does not mean, however, that there should be no consideration of such items as land forms and climate. It does mean that any study of natural environmental conditions should be made in terms of the needs and aptitudes of people; that there should be a functional evaluation of every physical condition considered. Such an approach does imply, however, that major attention will not be given to the intricate causes of climate or land form conditions. Such matters may very properly be taken up in a general science course or in courses in physical geography or physiography.

The Framework. No sooner do we decide on a course in world geography than we immediately face this question: how shall we divide up the world for study? Here we face one of the problems which have troubled geographers since the time of the ancient Greeks, for it is impossible to study the entire earth without subdividing our major task in some way. Thruout the history of geographic endeavor men have gone at this problem of studying the earth in one or another of two ways, or by a combination of the two: (1) by dividing the earth up into parts, or regions, and studying each part; (2) by leaving the earth whole, so to speak, and tracing out the individual patterns, both those which nature has provided, such as climatic features, and those which man himself has created. Where the first is followed we say that the organization is regional. Where the second is used, we speak of it as topical or systematic. Each of these approaches has its strength and its weaknesses. *I am not inclined greatly to favor one over the other, because I firmly believe that the competent teacher can secure the desired objective by either method if supplemented by liberal use of the other.*

A Topical-Regional Organization. A very satisfactory organization has these three parts: (1) a study of the elements and world patterns of the natural environment; (2) a consideration of the elements and world patterns created by man; and (3) a study of these natural and man-made elements as combined in important regions of the world.

If the course is introduced, as I believe it should be, with some attention to systematic geography, the teacher may go directly to the problem of clarifying the geographic concepts of the student and of filling in and amplifying his knowledge of world patterns. Geography does not have a highly specialized vocabulary, but does have a goodly number of terms that need to be discussed at some length, so that they may be used in the comparative study to follow. Such terms as latitude, longitude, low latitudes, delta, cyclone, hurricane and strait, need to be discussed in a meaningful way in terms of the fundamental problems men have met in making a satisfactory living on the earth. Special attention should be given to the arrangement of these features over the earth. We are not so much concerned with weather as such as with the weather experienced in different parts of the world; not with railroads but with the actual railroad patterns of the different regions and of the

earth as a whole. Too commonly the study of the elements of the natural environment ends with an identification and discussion of the conditions and leaves the pupil without a clear and lasting grasp of world patterns. To fail to teach the arrangement of these elements over the earth is to fall far short of the goal of world geography.

Some geography teachers introduce, in connection with the natural environment, practically all the human geography to be considered. For example, some organize the entire year's work on the basis of climatic regions and have poured into that mold all that is said about man and his works. This is carrying the emphasis on the natural environment too far. It is very certain to make environmental determinists of our pupils. Enough reference to man and his works should be brought into the discussion of environmental elements to see their significance in human affairs; but of equal importance is a separate study of those world patterns for which man himself is responsible.

Outstanding among the world patterns created by man are population, occupations, political arrangements, and circulation. One of the very best ways to begin a course in world geography is to start out with a study of the distribution of man and his works over the earth. Likewise, one of the best ways in which to close a course in human geography is to give definite attention to the circulatory patterns, routes of travel and trade and lines of communication. One of the principal ideas which should run clear thru a course in world geography is this, that the interdependence of the various parts of the earth has been brought about by circulation of men and goods and ideas, of winds and birds. Since our geography course is designed to help us understand this global world in which we live, a major place should be given to a geographic analysis of the ties which bind us together and of contacts thru which we compete and co-operate.

Ideally, such a study of the cultural patterns of the world, population, occupation, production, government, and circulation, should be followed by attention to specific regions or countries, where various cultural and natural environmental elements are seen in combination. If, as is wise, the home country is used thruout to illustrate the various points being made, it might be desirable to turn to foreign lands in this last phase of the work.

Even tho we grant that the world course in geography should

ideally consist of these three parts, a study of the natural patterns of the world, of the patterns which man has created, and of the combinations of those conditions in certain parts of the earth in which we have particular interest, we must recognize that such a plan, if followed leisurely, would crowd the year. For that or other reasons, the teacher may prefer another organization.

A Topical Organization. Another thoroly defensible plan is to divide the course more or less equally between a study of natural environmental conditions and those features for which man himself is responsible. The course, in other words, would be topical thruout. This procedure has a great deal to commend, particularly if the teacher centers the discussion on world patterns, making clear all the time that geographic facts refer to specific places. Its great weakness lies in the fact that it may fail to give a clear notion of how these various conditions combine to determine the individuality of specific regions. In my opinion, therefore, this approach should be brought to a close with one or more regional units, dealing with such areas as the home region or nation, or a selected part of Europe or Asia. If this material is not a part of the text being followed, it could easily be added by supplementary readings and other materials.

A Regional Organization. Recognizing the weaknesses of the topical approach, some teachers prefer to organize the work about countries and continents right from the start. Such a method has the great virtue of always making the pupils aware that they are studying particular places. It is a very concrete approach and ties in with the thinking of the pupils in connection with what they read in newspapers and magazines. It may, however, miss one of the main points of the course, namely, to develop a world viewpoint. On the other hand, if the teacher follows the comparative method and repeatedly points out relations between different parts of the world, the world view is sure to be presented. If this plan is used, I strongly recommend that the course be both opened and closed with topical units, such as the world distribution of population for the beginning and a study of world trade and travel at the close.

PLACE IN THE HIGH SCHOOL PROGRAM

This year course in world geography is best placed in the ninth and tenth grades where it can precede elective courses in geography and related aspects of the other social sciences. This course

in world geography should be considered a part of general education and should be required of every student. If, perchance, it seems that full credit cannot be required of everyone, then it may be possible to require half a year's work, with the other half devoted to a closely related subject. For example, the new social science course of study for the ninth grade in New York State combines world geography with an introduction to the economics of world citizenship. This combination makes it possible to carry some of the main ideas and ways of working of geography all thru the year. Less than a full year is not enough time in which to meet the needs we now recognize in the geographic field. Even a full year is not enough time in which to meet those needs in a thoroly adequate fashion. To keep the study of geography alive thruout the secondary period will require either additional courses in the field or considerable attention to geographic matters in related studies.

This general course should be and is commonly grouped with history and the other social studies. Unfortunately for simplicity in classification, the broad field of geography is both physical and social, that is, certain phases deal very specifically with the earth, other phases almost exclusively with man. I believe that it is well to recognize this distinction; indeed, I find by an examination of college catalogs that the distinction is commonly recognized in stating college entrance requirements, with credit being allowed for human geography in the social sciences and for physiography or physical geography in the physical science division.

Altho human geography is commonly classed with the social studies, it should not lose its identity in that group. This general course which is recommended as a required one for the ninth and tenth grades should be a *geography* course, with wide ramifications, of course, into related bodies of knowledge. Even a hasty examination of the list of needs that geography can help to fill will surely lead one to the conclusion that these needs are not so well met by some other social study. The problems and findings of geographical science must be studied if its educational values are to be realized. The educational returns from a study of geography will be greatest, however, if the teacher makes the study broad, if materials drawn from such related fields as history and sociology are used whenever pertinent. In other words, I am confident that it is wisest for every student of human behavior to strive to be aware of all of the major approaches to the study of man and to build his par-

ticular specialty on a broad foundation. We would then hear less of the shortcomings of the individual social studies and of the virtues of fusion.

Where the teaching staff and equipment are adequate, it is highly desirable to follow such a general course by an elective in geography; or, if the student is majoring in commerce, by a required course in economic geography. Among the desirable electives are: (1) geography of North America, for which splendid teaching materials are now available on the high school level; (2) political geography of leading countries; (3) conservation of natural resources; (4) economic geography, looking toward the preparation of students for commercial positions; (5) courses in what we may call physical geography—geomorphology, meteorology, and climatology. Where additional courses are given, the geography staff will ordinarily be competent to pass on the questions involved. Attention here is limited to the general introductory course.

Minimum Equipment for Teaching Geography

This basic high school course in world geography does not require a great deal of expensive equipment. On the other hand, some materials are essential, and certainly a room should be fitted up in which all of the geography classes are taught. Anyone who has had the experience of moving about from room to room, teaching a geography class in this room and that, knows that such a procedure is highly wasteful and that it is next to impossible to do the best job under those circumstances.

Texts. To my mind the most essential piece of equipment in teaching geography is a geography text. It is a source of readings, a collection of pictures, and a collection of maps, and not uncommonly contains valuable aids to study. Some years ago I talked with a high school teacher who bragged that he never used a text. I asked him what he did use as a guide. He produced a two-page mimeographed list of topics, and yet he had no book collection and the most meager map collection. Perhaps the controversy over text versus no text can best be answered in this way: be no slave to a text, but use one or more until you have collected readings, pictures, and maps which are as good and which can be made available to all of the students. Even then you may want a text as a basis for discussion, to give all a common ground on which to work. To me the ideal is for the beginning teacher to lean rather heavily on

the text, gradually working toward the point where it is more a source book and a collection of photographs and maps than a real course of study.

Globes. Next to the text I would place the globe. A physical-political globe on a floor stand, one that can be adjusted in height and can be moved around the room, is essential. In addition, there should be another globe, possibly a cheaper one, in a cradle, so that it can be moved around easily and studied in various positions. The use of a globe resting in a cradle is one of the more valuable innovations of recent years. If funds permit, it may be desirable to purchase a large slate globe, one on which places and various other facts can be shown. The average high school will not be able to afford a tellurian but may well own half a dozen of the little disc-like devices which S. W. Boggs has drawn up for the study of time belts, the so-called Boggs Teletime.

Maps and Atlases. In the minimum equipment for world maps are the following: a physical-political map, preferably on an equal-area projection; a political map, equal-area projection; a blackboard outline map, equal-area projection; a population map; a two-season rainfall map; a world vegetation map; and a polar-projection map, showing populated areas, trade routes, and so on. For each of the continents a physical-political map is desirable. In addition, we should have a physical-political map of the United States and a blackboard outline map of our country too. There should also be a physical-political map and a blackboard outline map of the home state. This minimum map collection can be added to in two principal ways—by securing additional wall and desk maps and by gathering materials for the making of maps, charts, and grafs. The class should have a number of outline wall maps on heavy paper, on which to trace whatever information is not available but is desired for wall use. Sometimes inexperienced teachers spend a great deal of money on maps with expensive mountings. It is my conviction that for most purposes the ordinary wooden rollers at top and bottom of the map provide an entirely satisfactory arrangement. Certainly, if the money for equipping the geography classroom is seriously limited, very little of it should be spent for expensive mountings.

We might hope for the time to come when our map collection would be supplemented with an atlas in the hands of every student. As a matter of fact, however, most geography textbooks for high

school include an atlas, either in the back of the book or scattered well thru it. This is another of the main reasons for having a textbook available in the hands of every student, even tho the teacher prefers to be independent of the organization which the text provides.

Pictures. Pictures are, of course, an essential in all geographic study. Fortunately, our texts are well equipped with them now so that the burden on the individual teacher is not as great as formerly. These text pictures will need to be supplemented, however, in a variety of ways. To do this, it is highly desirable, tho not absolutely essential, that the room be equipped for showing slides and opaque projections. This is one of the main reasons for having a geography room. The lantern should always be in place, and the room so equipped with dark shades that it can be darkened quickly for the lantern exhibit.

The use of motion pictures is a highly valuable feature of geographic instruction and is strongly recommended when circumstances permit. There is little to be said, however, for the use of occasional films at times which do not fit into the program. Slides which can be used when needed are preferable to elaborate sound movies which have little relation to the theme in hand. Certainly first-class work in geography can be done without the use of motion pictures.

Furniture and Equipment. In addition to the equipment noted above, it is wise to provide some instruments for weather study, such as a thermometer and barometer, and specimens of the common rocks and minerals. Most of the exhibits can be collected by the pupils, however, and cases or shelves should be provided for holding them. The geography room should also include a space for storing wall maps, a filing cabinet or a series of drawers where desk maps, photographs, clippings, and pamphlets can be stored, a large blackboard, and a large amount of bulletin-board space. Indeed, I am convinced that the need for much bulletin-board space is critical, for, with room for display, most deficiencies in maps and slides can be counterbalanced by the use of materials which the pupils can gather themselves.

If the pupils are to do what they can toward equipping the geography classroom, they will not only need outline maps and ruled paper, but also drawing pens, triangles, rulers, and tracing paper. Colored chalk, preferably of the lighter shades, is also an essential.

In spite of the length of this list of equipment, the basic year course in geography can be taught with relatively little cash outlay at the beginning. An alert class can quickly assemble a wealth of photographic and map material at almost no expense. With a globe, a first-class physical-political map of the world, and some up-to-date atlases, the class can get under way. For a more complete analysis of the problem of equipping a high school geography room, the reader is referred to the article by Neil F. Martin which appeared in THE JOURNAL OF GEOGRAPHY, Vol. XXXVIII, 1939, pp. 226-232. This article gives the experiences of a mature, competent high school teacher.

WHAT TO LOOK FOR IN THE GEOGRAPHY TEACHER

The geography teacher should be trained for the job, possessing both special training in geography and a rich background in related fields; and, if at all possible, he should possess certain personal qualities which are perhaps not so necessary in other fields.

In checking over the desired training for a high school teacher of geography, I need only to remind you of the conclusions of the Committee of Standards of Certification for the Teaching of Geography in High Schools, of which Alfred H. Meyer was chairman. As concluded in their report (JOURNAL OF GEOGRAPHY, Vol. LXII, 1943, p. 460), the certificate in geography should in every case meet as high a standard as that set for history. As a part of this requirement, the teacher should have a general introductory course in the principles of college geography, 3-6 semester hours; a regional course in continental, historical, or political geography, 3 semester hours; and a topical course in economic and commercial or conservational geography, 3 semester hours. Certainly this is an absolute minimum, no matter what the certification requirements of the individual state may be.

Besides courses in geography, equal to those normally required of teachers of history, I am convinced that the best geography teacher will have a good grounding in related social and physical sciences. In the social sciences, history, regional sociology, economics of land utilization, anthropology—the list of possible approaches is long. Without this training, however, the student will not, as a rule, appreciate the ways in which man makes his own geography. In the physical sciences, geology, meterology, and botany are of outstanding importance. Without some such training, the teacher will lack an understanding of the physical earth. As

human geography deals with both man and the earth, it would seem imperative that both phases of our environment be investigated by the prospective teacher. As the course designed is one in human geography, however, the social side should receive the major emphasis.

To the requirement of adequate training in geography and related social and physical sciences, I am impelled to add another. The most effective geography teacher will have a genuine sympathy and liking for men of all lands. The narrow, the bigoted, the intensely nationalistic, the belligerent individual may convert geography into a school of hate, of odious comparison. If geography is to function in an effective way in furthering an understanding and appreciation of other peoples, whether in our own nation or in foreign lands, it is necessary that the teacher himself be thoroly imbued with regard for his fellow men.

Conclusion

There is general recognition that high school students need the kind of education that the study of geography can provide. To meet that need, every high school student should have at least one year of world human geography, designed, among other things, to give him an understanding of the world as a whole and of its various parts. In order for this required course in geography to be carried out most effectively, it should be taught in a room fitted up for the purpose. The equipment need not be expensive in the beginning, and there should be adequate provision for assembling the kinds of materials which the students and the teacher can themselves provide. Such a program calls, obviously, for a trained teacher, not simply for some one who happens to have a free period. This teacher will not only be well grounded in the facts and methodology of geography but will also have a rich background in related physical and social sciences, and will possess the kind of inquiring, sympathetic mind that views men all over the world as brothers in the common problem of living the best kind of life possible on this earth.

THE GEOSTRATEGY OF LOCATION

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Only 5,000 years and 4,000 miles separate the pioneers of Western civilization in the river valleys of the Middle East from the aerial pilots of the future in the Mediterranean of the Arctic. Man's knowledge of the earth has increased while his methods of warfare have changed. The early Egyptians and Babylonians, located along their river valleys, only knew the importance of land power represented by armies; the Cretans and the Athenians, living along the inland sea of the Mediterranean, realized the significance of sea power expressed by navies; later the British, located on the geographical periphery of western Europe, looked to the world ocean for expansion while the Russians, situated in the heartland of the world island, placed their stress on land power; finally the polar states, noting the Great Circle routes across the Arctic in an age of air power, look to the polar skies of the future.

River Valleys

The cradles of Western civilization were located in the river valleys of the Nile in Egypt and the Tigris and Euphrates in Mesopotamia. Here the environment offered a favorable but not too easy existence for man. The Nile and the Tigris and Euphrates not only furnished the fertile soil for crop production but also provided the floods that taxed the ingenuity of the inhabitants. The Biblical account of the deluge may have a historical origin in the floods of the Tigris and Euphrates. The climate of the area was conducive to an existence based primarily upon agriculture. The famous law code of Hammurabi reflected the influence of the environment especially in the careful provisions for the supervision of waterways. The rivers also provided the avenues of trade in a period when the muscles of man and the winds of the sky were the motive power of ships. The river valleys became a unifying factor in the political development of the peoples. Egypt and Babylonia could not remain separated into upper and lower divisions. Menes (c.3200 B.C.) united Upper and Lower Egypt just as Sargon I (c.2630 B.C.) united Sumeria and Akkad in Mesopotamia.

However, the civilizations of the river valleys were not destined to remain isolated. The Fertile Crescent, extending from the Mediterranean and Red Seas on the west to the Iranian mountains on the

east and from the Armenian highlands on the north to the Persian Gulf and Indian Ocean on the south, became an avenue of trade and conquest. First the Assyrians under Sargon II, then the Persians under Cambyses, and later the Macedonians under Alexander the Great used the Fertile Crescent as an avenue in ruling both of the cradles of Western civilization. Significantly the might of all these early peoples was based solely on the land power of armies.

INLAND SEA

The inland sea of the Mediterranean was the next great scene of man's activity. Thruout history the Mediterranean has served either as a unifying or as a separating factor. Rome was the only world state ever to rule all the littoral areas of the Mediterranean. Most of the time the shores of this great sea have been jealously guarded by the navies of rival states. The first navy to appear in the Mediterranean probably came from Crete. The fleet of the rulers of this island controlled the eastern Aegean Sea while Cnossus became one of the leading commercial cities in the world. The power of the kings of Crete came to an abrupt termination around 1400 B.C. Later the Phoenicians on the shores of the eastern Mediterranean with the bases of Tyre and Sidon rose to prominence. Phoenician ships ventured to the shores of Africa, Spain and even Britian while colonists from Tyre founded Carthage in 800 B.C. Only the defeat of the Phoenician navy and the siege of the island base of Tyre enabled Alexander the Great to end Phoencian sea power in 333 B.C.

The ancient Greeks naturally turned to the sea: the total area of Greece was only 45,000 square miles; many inlets and bays occur along the south and east coast; the land is mountainous while the valleys and coastal lowlands are narrow. Xerxes of Persia was defeated by the superior navy of the Athenians in the battle of Salamis in 480 B.C. The Golden Age of Pericles saw the Athenian Empire ruling over most of the islands and coastlines of the Aegean. The Spartans in the Peloponnesian War finally were able to capture the city of Athens only after defeating the Athenian navy with Persian financial aid.

The Romans began as a land power in the central part of the peninsula that occupies the waist of the Mediterranean. Italy separates the western basin of the Mediterranean with its length of 900 miles from the eastern basin with its length of 1,000 miles.

Only the menace of the Carthaginian navy in the First Punic War caused the Romans to build a fleet of their own. Eventually the Carthaginians were defeated on sea and on land in the Punic Wars. After all of the shores of the Mediterranean were conquered by the Roman legions, Mare Nostrum became a reality of the Caesars and the Roman navy was allowed to decline. Rome once more became primarily a land power with all roads around the inland sea leading to the Eternal City. At the zenith of the territorial expansion of the Roman Empire under Trajan around 100 A.D., natural boundaries marked the extent of the laws of Rome—the Atlantic on the west, the Danube and Rhine rivers on the north, the Tigris and Euphrates on the east, and the Sahara and Arabian deserts on the south. After the fall of the Roman Empire the Mediterranean once more became the scene of hostile naval forces—the Saracens and Normans, the Venetians and Genoese, the British, French, and Italians.

World Ocean

The geographic discoveries of the 1400's turned the attention of the western world from the inland sea of the Mediterranean to the world ocean. The early writings of Marco Polo about Persia, China, and India; the invention of the mariner's compass and the making of maps; the eagerness of the Atlantic seaboard states to break the monopoly of the Italian city states in oriental trade; and the explorations of Diaz, Vasco da Gama, Columbus and Magellan —all played their part in the transition of geographical thought to the world ocean. Spain and Portugal led in the early period of discovery with the famous Papal Demarcation Line of 1493 as a symbol of colonial arrogance. The decline of the Spanish and Portuguese empires heralded the rise of the Dutch, French and British. The defeat of the Spanish Armada in 1588 placed the British navy in a leading position just as the defeat of Napoleon's fleet at Trafalgar in 1805 marked a decisive triumph of British sea power.

The oceans of our grammar school days—the Atlantic, the Pacific, the Indian, the Arctic and the Antarctic—have become one world ocean. As a result of Lord Nelson's victory at Trafalgar, the British navy ruled this world ocean. In the War of 1812 the British blockaded the American seaboard and Washington was burned in 1814; in the Opium War of 1840-42 the Chinese were defeated and Hong Kong was annexed; in the Crimean War from 1854-56 British ships carried soldiers thru the Mediterranean and Black seas to

the Crimea while naval units even raided Petropavlovsk in Kamchatka; thru the Nineteenth Century the British were consolidating their gains in India while Victoria became Empress of India in 1877; finally at the end of the 1800's the British were fighting the Boers in South Africa 6,000 miles away from the homeland. The British Commonwealth-Empire, covering one-fourth of the land area of the earth, is a tribute to sea power.

By the outbreak of the Second World War all the great powers had navies altho the three big navies were the British, American and Japanese. The French, Italian, German and Russian navies ranked below the "big three." By the summer of 1944 the naval balance had changed: the French navy had been largely scuttled at Toulon; much of the Italian fleet had come over to the United Nations; the German navy had been greatly reduced; and the Japanese fleet had been driven back to its home waters. After the war only two world navies will remain—the British and the American. From the viewpoint of sea power the Atlantic will be divided between the British and American fleets while the Pacific will largely represent American sea power and the Indian, British. Eventually China and Russia may develop big navies depending upon the growing unity of the former and the fulfillment of the latter's desire for warm water ports.

WORLD ISLAND

Only a strong land power in back of the coastline could have checked the British in their expansion in the Nineteenth Century. If the United States and China had been firmly unified, the British from their faraway home base could never have penetrated behind the coastline of these states. Due to the influence of the distinguished British geographer, Sir Halford Mackinder, and the illustrious, if not infamous, German geographer, Major General Karl Haushofer the significance of the distribution of the land mass of the earth is being analyzed. Formerly in grammar school we were taught that seven continents existed—Europe, Asia, Africa, North America, South America, Australia and Antarctica. The geopolitical concept of the world island is frequently discussed, tho not always accepted. The world island consists of Europe, Asia and Africa. Europe is really a peninsula of Asia separated by the low Ural Mountains just as India is a peninsula separated from the rest of Asia by the lofty Himalayas. The plains of northern Russia extend westward into the plains of northern Europe, serv-

ing as a military highway both east and west. Africa is joined to Asia at Suez and almost at the Strait of Bab-el-Mandeb. Africa is only twelve miles removed from Europe at Gibraltar and ninety miles at Sicily. The Nile River, Red Sea and the Tigris-Euphrates rivers are parallel depressions in the physical unity of Africa and Asia. The Mediterranean Sea is well named—in the midst of land—Europe, Asia and Africa.

The world island contains seven-eighths of the earth's population, two-thirds of the land mass, and the bulk of the natural resources of the earth. Here were located six of the seven world powers of 1939—the Soviet Union, Great Britain, France, Germany, Italy and Japan. The development of air power in the Twentieth Century scarcely justifies the separation of the British and Japanese homelands from the world island by calling them offshore islands. In an age of sea power, this thesis was valid but not in an age of growing air power. Historically the powers of the world island have been located on the coastland or rimland. Sir Halford Mackinder believes that the fulcrum of power in the world island has shifted to the heartland, the area in general between the Volga and Yenesei basins, as he has recently defined it. On the other hand, Nicholas Spykman asserted shortly before his death that the rimland of the world island is still the vital area. Most geographers agree that the control of the world island by one power would be a menace to the security of the United States, the only great power outside the world island. The Germans and the Japanese in the Second World War have tried to control the rimland of the world island and isolate the Soviet Union and China. At the high tide of Nazi aggression in the fall of 1942 one pincer of the Germans extended to the very streets of Stalingrad while the other reached almost to the outskirts of Alexandria. After a possible meeting of the pincers in Iraq or Iran, the Germans planned to move toward turbulent India where they might join the Japanese already established in Burma, and the Andaman and Nicobar islands. The siege of Stalingrad may go down in history as the turning point of the Second World War.

Arctic Mediterranean

The development of air power has recently resulted in a new emphasis on location. The polar areas of the Arctic, an inland sea of the Atlantic, may become very important in an air age. Such men as Vilhjalmur Stefansson and George T. Renner have em-

phasized the strategic importance of the area. This importance lies in the Great Circle routes from America to Eurasia over the Arctic. Three-fourths of the land mass of the world is in the northern hemisphere grouped around the North Pole. The shortest distances from Chicago to Chungking, from San Francisco to Moscow, from Panama to Singapore, and from the North Cape of Norway to Des Moines, Iowa are via the Arctic. The Soviet fliers in 1937 took a forward step in their flight from Moscow to California over the polar area. At present flying conditions in this part of the world are bad. Instrument flying, radio communications, and beam control are impaired by magnetic and electrical disturbances in polar areas. Problems of thawing out controls, warming engines, and handling metal bombsights are caused by the cold polar air. However, it is no colder 36,000 feet above the equator than over the North Pole. The difficulties of Arctic flying will undoubtedly be mastered by aviation. Finally the presence of oil in the northern areas of Alaska, Canada and Siberia may eventually be an asset of tremendous importance for the development of Arctic routes.

The polar states of the present are the Soviet Union, Canada, the United States, Norway, ~~Denmark~~ and Finland. The Soviet Union has made the most progress in developing the Arctic. The many meteorology stations, the ice cutters of 11,000 tons, the research in polar flying, and the expansion of maritime commerce along the famous northeast passage during the months of August and September are proof of Soviet Russia's initiative. Canada has not been so active partly due to the fact that the northwest passage along the northern areas of the dominion is not so navigable. Alaska is the only polar area under the American flag in peacetime. Point Barrow in northern Alaska is the site of a naval oil reserve of 30,000 square miles altho no petroleum has been acquired from this area yet. Greenland and Iceland are both occupied by American troops but the mother country is Denmark. Greenland is a vital strategic outpost of the United States as well as a valuable location for weather prediction in Europe. Iceland was united to Denmark by a common king but the former planned to become a republic in June, 1944. Norway's role in the Arctic is due to the strategic location of the North Cape and to the control of Svalbard. This island has seen fighting in the Second World War with British, Norwegian and German troops struggling for the mastery of the area. This is as far north as the battlefields of the Second World

War have extended. Finland possesses Petsamo in the Arctic with the valuable deposits of nickel nearby. However, the Soviet Union will probably annex Petsamo at the conclusion of the present war. The strategic location of Russia in the heartland may be supplemented by the position of the U.S.S.R. on the Arctic Mediterranean. Altho the Arctic may become important in future aviation, it will never become a base for world power like the middle latitudes.

The change in the importance of any geographical location is due to the technological advance of man. Land power, sea power and air power have all vitally affected the strategy of a given area. Land power united the peoples of the valleys of the Nile and Tigris-Euphrates; sea power enabled the expansion of the British over one-fourth of the earth's surface; air power may turn many of the valueless wastes of the Arctic into strategic locations. Probably the land, sea and air horizons of the world have already been reached. The future people of the Twentieth Century may utilize either for constructive or destructive purposes the earth of the Creator.

IS "GLOBAL GEOGRAPHY" THE ANSWER?

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It is doubtless true that millions of people will fly in the not too distant future. It is also no less true that the vast majority of world citizenry, including the people within our own United States' boundaries, will be "grounded" for most of their lives. Even in war time, with its accompanying swarms of planes, this is true.

GEOGRAPHIC EDUCATION FOR WAR

To the soldier crawling on his stomach in the jungles of the Southwest Pacific, to the air borne trooper hacking his way thru the Burma jungle, to the infantryman and the artilleryman struggling in the winter mud of central Italy's mountainous area, or to our invading hordes assaulting northwestern Europe a mile on the ground is still a long way. However, this is not the whole story. Even pilots, co-pilots and navigators who span this "Global World" pour diligently over terrain maps and, before taking off, analyze by the hour numerous weather maps. While aloft they keep in constant touch with ground stations regarding weather condi-

tions and rely with faith upon the reports of bases regarding landing conditions. These comments regarding flight are just as important in peacetime as in wartime. Is it not logical that we in our schools at least lay the foundation for such training required to do any or all of the above mentioned tasks?

Geographic Education for Peace

However, let us turn to the other fields that would be open to students following the course of study which this author will suggest later in this article. Elementary meteorological study, or a "weather elements study" can be expanded into the fields not only associated with aviation, but also into weather analysis, forecasting, climatology and agricultural studies.

A study of the terrain and topographic maps of the students' local area, combining both indoor and outdoor work, is another vital phase of a high school geography course which has tremendous expansion possibilities. The ramifications of this study are practically unlimited. They lead into civil engineering, hydrography, geological survey, architectural and construction work, mining, real estate and advertising, to mention a few. Not the least of the benefits to be derived would be the development of a nation of men and women trained in map reading and interpretation so that if and when another war should come upon us our fighting forces will be much better prepared along this line than they were at the start of the present conflict.

Furthermore, most high schools are equipped with mechanical drawing instruments. Is it not possible that the skill of handling these instruments could be acquired by drawing a few map projections and making a few simple maps? Problems of perspective, projection and fine plan details could be done in map work just as well as by the traditional drawing of the top, front and end view of a wooden cylinder placed upon a rectangular block of wood.

Persons trained in cartography and graphics are in great demand during this war. Magazines, newspapers and business concerns now are using and will continue to use cartographic displays and graphic devices to facilitate the public's grasp of news and advertisements at a glance. This field of geography, the use of the tools, expands obviously into numerous war and peacetime positions for the boys and girls who show ability along this line once the opportunity presents itself for them to develop it.

We do not make automobile mechanics by telling students how fast and far a car will go. We do not make a farmer by explaining how much a tractor can accomplish. Neither do we make better trained high school geographers by explaining what to most is obvious—that the next age will be an "Air Age," the world is growing smaller, and that great changes will come about.

We do make mechanics by having them assemble the engine piece by piece; farmers become able and prosperous by "doing the chores"; a sound, basic geography training is best obtained by understanding the why of the fundamental factors and by performing the tasks required.

The author is assuming that the school system has included the regular courses in geography usually continued as far as eighth grade. Consequently he suggests that geography of a general type should be forsaken for more specific work which can grow out quite naturally from the previous studies.

The "Global" Approach

Another phase of geography which the author believes could stand analysis involves the why and wherefore of the trade routes. We see many new "Air-Age" maps, distances measured in hours instead of miles; we see the probable air routes of the future—some crossing, and even terminating in, desert wastes. Is it not true that trade is based upon the unequal distribution of people and products? Would not our trade routes by air be better understood if we were to consider what is to be carried, whether the cargo needs be precious or commonplace. The author cannot become enthusiastic over proposed routes shown on some maps such as Minneapolis to Bombay, or Fairbanks to Murmansk across the polar regions, or Cairo, Egypt to Mogadiscio, East Africa. A careful weighing of the products on each end of any proposed trade route, whether it be by land, sea or air, is in the author's opinion, one of the very best approaches to this study of "Global Geography." The Senior High School student will find this study in great correlation with "Problems of Democracy," and history courses in general.

Proposed Content

In summarizing then let me propose the following as the content of a Senior High School Geography course.

First, we must grant that "Global Geography" has great appeal

and that the airplane has probably done most to make it so in the eyes of the high school student. Consequently, we will study the three major geographic factors that concern aviation in war and particularly in peacetime; namely, the weather conditions, the terrain, and the location of surplus products from the fields, forests, sea, or rivers. In doing so, however, we must not neglect the fact that there are people who will not fly as well as those who will fly. An elementary course in meteorology involving the theoretical as well as the practical use of instruments would assist in getting across some of the above ideas. This study could be enlarged into a brief introduction to the world's major climatic types utilizing specific data assembled for a few stations in each type.

A topographic study of the area in which the high school is located comes next. Classroom reading of maps, projections and elementary map making, plus the use of whatever cartographic instruments that may be on hand or purchased will give tangible and far-reaching results.

Lastly, the course should include the study of trade routes and the reasons for their establishment, their relative size and their permanency.

The Increments

In conclusion, there is one highly significant fact that must not be overlooked by any geographer who has the interest of his field at heart. Such a course as the one proposed above would challenge the *average* and *better than average* student. No longer would the memorization of a few products and places be sufficient to pass the high school geography course and so earn the few units necessary to graduate the below average student.

Non-geographically trained teachers who might be called upon to teach the proposed course would have greater respect for our field of geography, in much the same manner as many retooled college professors had when called upon to do the job in A. S. T. P. units. So the author's plea is that we eliminate as much as possible the veneer which could quite easily cover our "Global World," and in its stead keep our feet on the ground literally, a map in our hands, and an eagle eye on the weather. Teach what our world neighbors have that will help us, and what we have that will help them, and we will awaken, I am sure, in the not too distant future to the realization that our "Global World" relations have like Topsy "just growed."

THE HACKENSACK MEADOWS

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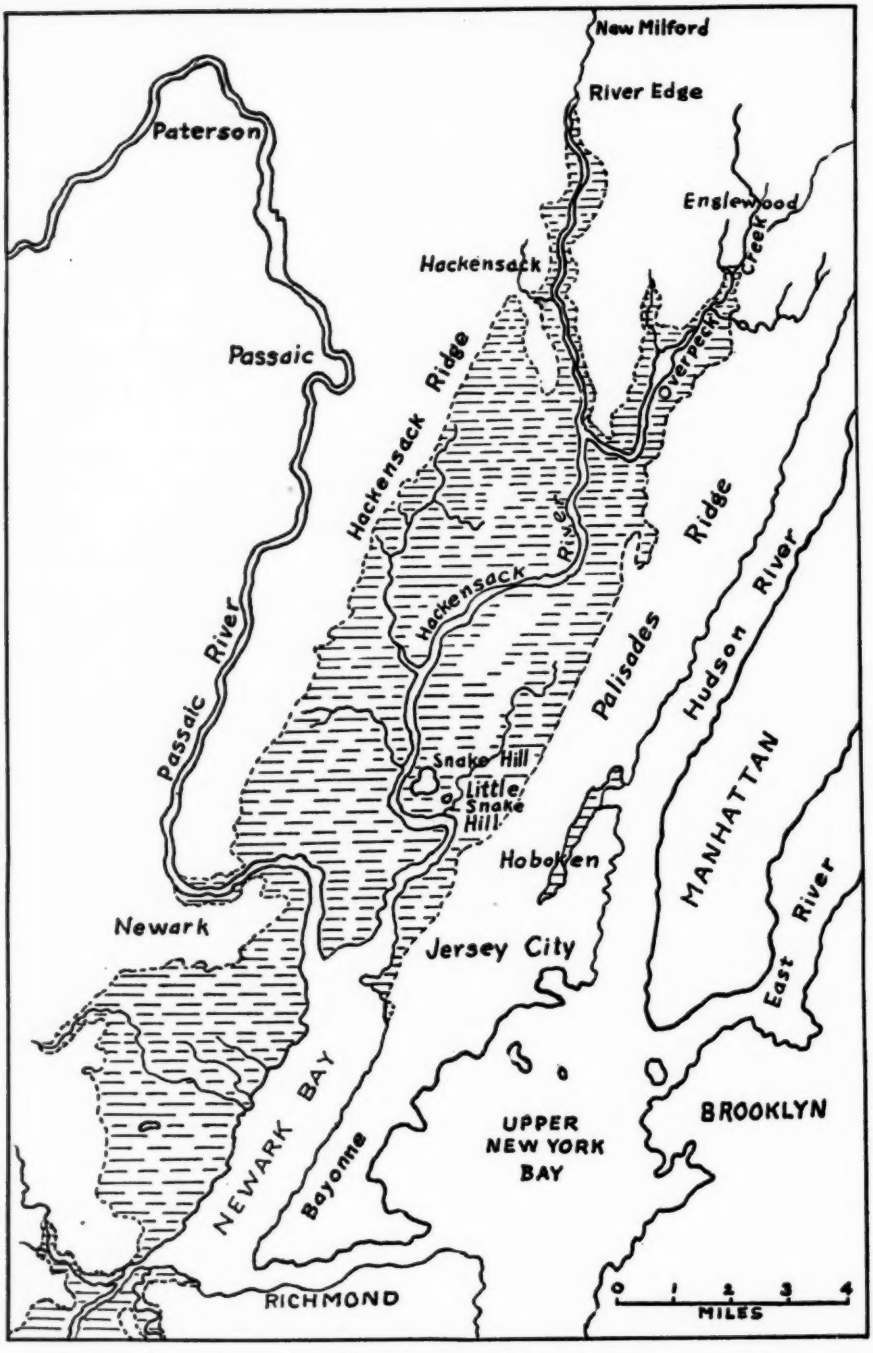
The largest piece of unoccupied land in the New York Metropolitan Region is the area known as the Hackensack Meadows. Its extensive grassy expanse, roughly a rectangle four miles wide and ten miles long, is a striking anomaly in the most densely populated district in the world where every square foot of space is at a premium. Man's failure to utilize it, or rather his ability to utilize only small parts of it for low-grade uses, is a forceful illustration of the fact that he still exhibits considerable ineptitude in geographic adjustment.

PHYSICAL CHARACTER

The Hackensack Meadows occupy the central portion of the Triassic Lowland, a banana-shaped area of low country tucked in between the Reading and Manhattan prongs of the New England hill country and the Carlisle and Trenton prongs of the Piedmont Upland. Some two hundred million years ago or so, a large area of red desert sandstone and shale was deposited in what is now the Middle Atlantic region. Extensive volcanic eruptions were poured out and sheets of trap rock were intruded into the sandstones, shales, and lava sheets downward for many hundreds of feet.

During the millions of years which ensued, erosion reduced the region to approximate sea level and removed all the red sandstones, shales, and lava sheets except those in the down-dropped block. The land was uplifted at the beginning of the Tertiary Age and erosion commenced again. It has proceeded far enough to reduce the weak sandstones and shales to a level lowland, leaving the tilted and bevelled-off edges of the lava sheets standing up as long parallel ridges. During the Ice Age, the continental glacier moved southwestward down the Triassic Lowland as far as Raritan Bay. It left the land strewn with boulders, and dotted with moraines and small lakes.

During or shortly after the Ice Age, the coastline subsided somewhat, creating New York, Newark, and Raritan bays, and drowning slightly the lower courses of the Hackensack, Passaic, and other streams. This was particularly marked in the lower course of the Hackensack River where subsequent silting and deposition of reeds, cat-tails, and marsh grasses has produced the level-surfaced meadows.



The main axis of the Hackensack Valley is 45 feet above tide at the New York State line; thence it falls to tide level at New

Milford, and from Englewood and Hackensack southwest is occupied by a broad belt of salt marsh. This marsh land is but 2 or 3 inches above the level of high tide. The Meadows are still in the process of accumulation, making a peaty mass composed of matted stems and roots at the top, but becoming more compact and showing less vegetable structure at some distance below the surface. The depth of silt accumulations vary from 10 to 20 feet. True rock bottom lies far below. In some deep wells on the Meadow south of Snake Hill no rock is reached at 200 feet. Snake Hill is a lava stock rising boldly from the southern part of the Meadows.

Natural Plant and Animal Life

North of Snake Hill the surface of peat and mud was once covered with a vigorous growth of cedar trees whose stumps and prostrate trunks still lie about. Seen from the train window the flats now seem to be covered with a tall reed-like grass, "Phragmites Communis." It forms a tropic-like jungle of stout leafy stems, 5 to 15 feet tall, bearing plumes of violet and purple in the fall which change to silvery white as the blossoms fade. The horizontal root stocks spreading far from the stem, form a densely interwoven mat that holds mud and decaying vegetation and so affords a resting place for water-loving plants, which in turn are held and give firmer soil to other marsh plants and grasses.

Only 100 years ago the plants and waters of the Meadows were sufficient to provide an abundant animal life of fish, wild fowls, muskrats, snakes, rabbits, squirrels, beavers, opossums, weasels, deer, foxes, wolves, and panthers. Hence many hunters frequented the marsh for sport and food. Today, in spite of polluted streams, dumps, and industrial encroachment, large numbers of small animals, such as swamp mice, frogs, turtles, black and brown snakes, shrews, coots, gallinules, shrikes, marsh wrens, owls, hawks, bobolinks, and migratory birds live on the marsh. Mosquitoes, deerflies, and other marsh-bred insects have always been ubiquitous.

Mineral Resources

About a mile north of Arlington, New Jersey the Schuyler Copper Mine has been worked at intervals since 1719, but copper-bearing sandstone has never proved profitable, and in 1825 for a while most of the mine became a famous mushroom farm. The two traprock knobs, Snake Hill (175 feet) and Little Snake Hill (78 feet) rise steeply out of the salt marsh. The State of New Jersey

uses the largest of these meadow islands as segregated land for various of its institutions, and as a prison quarry yielding trap rock.

Clay along the Hackensack River was early found excellent for bricks. Over the crooked river, 40 years ago, schooners moved sluggishly with the tide and such winds as could be induced to fill their sails. They carried out building brick and wood for the east coast trade. A considerable fleet of windjammers acted as general freighters as far north as New Milford and yachting was common on the then-clean waters of the river. Today only an occasional small boat carrying coal, road-building materials, or oil uses the water highway.

EARLY USE OF THE MEADOWS

Indians shunned the Meadows as permanent camp sites. Frequent large shell heaps, however, evidence regular use of some areas during the fishing season when shad, sturgeon, salmon, oysters, and clams were abundant on the upper Hackensack and in Newark Bay. Some writers have asserted that the Dutch landed on the Jersey shore and made a settlement as early as 1610. Others say the date was 1618. Be that as it may, Washington Irving humorously describes the first Dutch contact with the Indians:

> The GOEDE VROUW (good wife) came to anchor at the mouth of the Hudson. . . . Here, lifting up their eyes, they beheld, on what is at present called the Jersey Shore, a small Indian village pleasantly embowered in a grove of spreading elms, and the natives all collected on the beach, gazing in stupid admiration at the GOEDE VROUW. A boat was immediately dispatched to enter into a treaty with them, and approaching the shore, hailed them through a trumpet, in the most friendly terms; but so horribly confounded were these poor savages at the tremendous and uncouth sound of the low Dutch language, that they one and all took to their heels, and scampered over the Bergen Hills, nor did they stop until they had buried themselves, head and ears, in the marshes on the other side, where they all miserably perished to a man, and their bones being collected, and decently covered by the Tammany Society of that day, formed that singular mound called Snake Hill, which rises out of the center of the salt marshes. . . . Accordingly they descended from the GOEDE VROUW, men, women, and children in goodly groups, as did the animals of yore from the Ark, and formed themselves into a thriving settlement, which they called by the Indian name, Communipau (now Jersey City).

In reality the colonization of unprotected New Jersey was deferred by the ravages of the Indians. Settlements were started only to be abandoned because Fort Amsterdam, located across the Hudson, was for a long time the only safe place of refuge for those who fled from the Indians' tomahawks and scalping knives. Finally, in 1658, Governor Stuyvesant purchased from the Indians the area between the Hudson River, the Hackensack River, and

Newark Bay for 80 fathoms of wampum, 20 fathoms of cloth, 12 brass kettles, and one-half barrel of strong beer. Settlers were commanded to arrange themselves in towns behind stockades and ordered not to thatch their houses with easily burned marsh reeds. With the help of Negro slaves, who sometimes escaped their masters thru the swamp, the industrious Dutch built fine plantations on pieces of upland and harnessed the tidewater streams to turn their millwheels. Meadow grass provided fodder for stock and litter for bedding animals. Cedar from the swamp fed fireplaces and furnished materials for corduroy roads across the Meadows. In 1796, The Duke of Rochefoucauld traveled over one of these corduroy roads and said it was exceedingly rough as it consisted of trees having their branches cut away, disposed longitudinally one beside another, and slightly covered with earth. Another visitor of the time, Brissot de Warville, thus writes: "There is a causeway to Belleville built wholly of wood with much labor and perseverance, in the midst of water and soil that trembles under your feet. It proves to what point may be carried the patience of man, who is determined to conquer nature." The early railroad engineers had need of patience also. Treacherous foundations would sink and entirely disappear in a single night. Today a good many thousand tons of rock lie in the marsh as groundwork for a great network of railroad lines converging from nearly all parts of the United States.

The Problem of Utilization

In other countries, particularly Holland, immense areas have been reclaimed from the sea by diking, but little has been done with the Hackensack Meadows because no very promising results followed from experiments already made. One reason for this lack of success is the nature of the swamp deposit which consists of undecomposed vegetable matter to so great a depth that it is useless for agriculture. In 1815, three well-to-do brothers of New York City, named Swartwout, had a dream. They purchased 4,200 acres of salt marsh for $200,000. By building 10 miles of embankment and 100 miles of ditches, 1,500 acres were reclaimed. In three years their wealth was gone. Still confident of the venture they applied for aid from the City of New York, but it was refused. Mortgaging everything, they kept on. As a last resort the brothers sent their maps to Holland in the hope they might interest Dutch devotees of low ground reclamation and canals. This also proved a failure. Finally after all means had been exhausted, they gave up—victims of the

Hackensack Meadows! During the early 1930s, a considerable number of depression victims took to the Meadows and planted little gardens beside sheet-iron and crate-box houses. The ground yielded so little for their efforts it was soon abandoned. Today thousands of pigs are raised in Secaucus, at the Meadow's edge and just a few minutes ride from Times Square, but their food must be brought by garbage trucks from metropolitan hotels and institutions.

The Meadows constitute approximately 30,000 acres distributed about as follows:

	%
Private and miscellaneous ownership	68
Ownership by industrial and transportation corporations	25
Public ownership	6
Ownership by public utility corporations of New Jersey	1

How best to utilize the tide marshes has long been a problem. In 1890, one New Jersey legislator declared reclamation would "put the metropolis of the world on this side of the river where it belongs" and succeeded in having himself head a committee that visited Holland. Altho detailed reports were drawn up, even itemizing the prices of windmills in quantity, little came of the committee's effort. The Meadows Reclamation Commission of New Jersey has urged the cooperation of public authorities in the fourteen communities bordering on the marshes, showing how the enormous required expenditure for Meadow improvement would be profitable. The Commission pointed out that marsh land in 1910 was worth from $50 to $100 per acre, but that in 1929 reasonable figures per acre were: $483 for unimproved Meadow land, $2,370 for partially improved, and $10,130 for fully improved. If ultimately the whole area of the Meadows were covered with industrial plants it would, it is claimed, provide occupation for 720,000 workers supporting a population of 5,350,000 persons.

In 1931, the Committee on the Regional Plan of New York and its Environs drew up an elaborate proposal for the Meadows. The engineering problem would involve raising a piece of land greater than the whole of Manhattan Island 10 feet above its present level and straightening the Hackensack River. The report proposed the dredging of a system of canals which would offer great possibilities for a distinctive and attractive type of development. In residential areas, canals might be bordered by a small strip of public park as in parts of Amsterdam, Holland. The Committee urged greater

concentration of industry in the section south of the Erie Railroad, while north of that line would be a residential development and public open spaces with a network of boulevards and parkways. A proposed dam across Overpeck Creek would create a large marine park in the north, and a remade Hackensack River with yachting basins bordered by landscaped promenades and bridle paths would be a beautiful recreational stream.

More recently other city planners have foreseen the Meadows as the parking place for all the little helicopters which someday may be owned by city dwellers in this vicinity. Still others hope that the future may bring decentralization of industry and waning urban population; then the marsh may once again come into its natural use as a wild fowl sanctuary. Or the Meadows may be diked, ditched, and laboriously and expensively converted into a dairy and truck-garden area to help supply metropolitan markets. Future utilization will obviously depend upon the status of city planning in the New York Metropolitan Region.

CONFORMATION OF NON-IRRIGATED DESERT OCCUPANCE TO TRANSPORT PATTERNS

PFC. CHARLES W. JOHNSON, U. S. ARMY

Extended maneuvers in a desert zone enable a soldier to roam thruout that desert, far off the beaten paths and under all conditions existing there. Thus, such a status perhaps qualifies for a better first-hand and wider local analysis of desert occupance than that of the transient geographer or one who lives on the fringe and makes occasional penetrations into the zone. However, these maneuvers so occupy his time as to permit only the visualization of an integral framework which others might utilize as a basis for a more detailed study. Therefore, it is to be hoped that these remarks may stimulate thought concerning the subject involved and lead to a far more complete investigation of the geographic postulate suggested by this article's title. Altho this geographic reconnaissance has only considered one arid region, it is quite possible that other similar regions will undergo a like metamorphosis with more modern encroachments upon them.

Our complex and changing civilization has superimposed modifications upon previous desert occupance patterns and has per-

mitted greater flexibility in variance from the old strict and close adherance to water sources. In olden days desert occupance was definitely held to local zones around these water sources except for caravans passing thru or nomadic groups which followed routes essentially dictated by water supply. This tended to produce a spotty and irregular pattern of settlement with seemingly little logical arrangement. However, exceptions such as along exotic rivers and around large water bodies did exist.

Some of the factors which assisted in bringing about recent changes in the desert landscape occupance are:

1. *Increased speed and amount of transport, communication, and trade in and thru these regions.*

With the coming of speedier vehicular transport, longer jumps between water holes came into being, or a complete hop could be made across the arid zones. This made possible the straightening of routes in by-passing many of the previously essential water sources and the reduction of these stops to a handful or possibly none. Therefore, water supply from sources within the desert was no longer primarily the determining factor in deciding transportation routes. There came into existence villages or stopping points which furnished other supplies or services essential to the traveler or the commodities traveling thru the desert. (Commodities here is used in the broad sense of commodities carried by aqueducts, power lines, etc., as well as those hauled by vehicles.) These occupance centers are located along the routes of travel—now the determining factor instead of water source. Of course, where possible, these trade centers obtain their water nearby thru deep wells or by other means, but not infrequently they depend on the hauling in of their supply. Thus, they are somewhat parasitic in nature in that they depend on their lifelines as well as being distribution points.

2. *Increasing populations with increasing supply demands in regions whose connecting overland supply routes are hampered by desert regions intervening.*

This is exemplified somewhat by coastal southern California which requires the trans-desert carrying of numerous commodities —water, power, supplies of many kinds, etc. To insure the continuous flow of these commodities to the market necessitates the establishment of desert maintenance, repair and trans-shipment stations. These formulate minute occupance centers.

3. *Increased irrigation along fringes of the desert or in nearby regions.*

These irrigated patches, altho not included in this study, encroach upon the desert and color its life in numerous ways—furnishing needed supplies for modern desert residence as well as serving as reconnoitering bases for some desert occupations and industries.

4. *Increasing demands for production of desert resources.*

The production of these resources in turn promotes more rapid transportation routes thru the desert and new industries of this nature are established, wherever possible, along main trans-desert routes or along connections with them. Frequently such industries are only highly profitable when such routes are nearby. Increasing use of such resources as sodium nitrate, borax, and gypsum thus contribute their bit toward establishment of modern settlement patterns within the desert.

5. *Increasing use of air-conditioning with its more comfortable living conditions during relaxation hours as well as during business hours in some cases.*

Of increasing significance, air conditioning has only touched the surface of its possibilities of utilization within the desert. Where installed it has already encouraged many to remain in desert occupations for longer periods than they had planned. Also it has served as a lure to newcomers and added materially to their satisfaction and desire to remain on the job.

The types of modern desert occupance influenced by these aforementioned factors are varied but generally fall under the following classifications:

1. *Small trading posts and centers*

These usually contain a combination of one or more of the following: filling station; small stock of prepared edibles, including essential groceries; drinks, non-alcoholic and otherwise; post office; reading materials; some amusement devices; novelties and trinkets; etc.

2. *Maintenance centers furnishing quarters and crew buildings for:*

a. railroads

b. power lines
c. aqueducts and irrigation ditches including pumping stations.
d. communications—telephone and telegraph
e. airplane beacon systems, weather stations, and airports.

3. *Fringe stations or out-posts*

These are the so-called "last chance" stations for supplies before entering the desert proper and also the "first chance" stops on leaving them. These border line stations play a lesser role in desert occupance but can be of extreme importance and frequently operate under conditions similar to those existing within the desert itself.

4. *Mining establishments or those for the exploiting of desert resources*

Some of the products mined are sodiuf nitrate, borax, sodium chloride, soda, gypsum, etc. The operators of these mines may live outside the region if they are close enough to the fringe of the desert, otherwise they usually occupy locations near the mines. Their supplies may be hauled in to them by the vehicles carrying out their mined products. Thus they too are parasitic in the sense that they exploit from the desert but return little to it except for their own use.

With some exceptions, modern desert occupance tends to furnish occupations which are distributive in nature. That is, they receive their commodities and then pass them on for use by others who themselves are passing thru, or they pass their commodities on directly thru to the outside for use.

In conclusion, the geographic postulate expressed in the title of this article does have exceptions but it is worthy of cognizance in any study of desert regions.

MEETING OF THE NATIONAL COUNCIL FOR THE SOCIAL STUDIES AND THE NATIONAL COUNCIL OF GEOGRAPHY TEACHERS

The Twenty-fourth annual meeting of the National Council for the Social Studies will be held at the Hotel Statler in Cleveland, Ohio, November 23-25, 1944. An extensive and comprehensive program has been prepared. Following the reception at 4:00 p.m. on Thursday, November 23, there will be a showing of some of the newer materials and devices in the field of audio-visual aids. The evening session will be devoted to the topic of "Moral and Psychological Basis of a Lasting Peace." The general session on November 24, will consider "Problems of Economic Welfare in the Post-War World."

The program Saturday, November 25, will open with a general session at which a special publication will be presented "which will chart the entire field of social education in the post-war world." This publication is designed to be of material aid to teachers and curriculum planners concerned with the great responsibility and importance of the field of social education in the post-war world. The general session will break up into interest groups according to grade levels and fields of specialization to discuss the implications of this statement of policy for their particular grade levels or subjects.

The climax of the convention will be the general session Saturday afternoon at 2:30 p.m. dealing with intercultural education under the theme of "Broader Realization of Democratic Values." This will deal with problems of race, ethnic, regional, religious, and world unity.

Sectional Meetings, Friday, November 24

Sectional meetings Friday morning and Friday afternoon will be built around related topics, so that listeners may remain with a single group for both sessions and a panel discussion on how the general statements embodied in the pamphlet can be translated into actual schoolroom practice. The Saturday morning meeting should help teachers chart their way thru the changes in social education already looming large above the educational horizon.

Joint Meetings

On Friday, November 24, there will be joint sessions of the National Council for the Social Studies and the National Council

of Geography Teachers. The following programs have been prepared for these sessions.

MORNING SESSION

Chairman: Dr. Guy-Harold Smith, Department of Geography, The Ohio State University, Columbus, Ohio
Secretary: Miss Melvina Svec, State Teachers College, Buffalo, New York
Geography and the Social Studies
Dr. Stanley D. Dodge, University of Michigan
The Responsibility of the Geography Teacher in the Upper Grades
Miss Edna E. Eisen, Kent State University, Kent, Ohio
Geography, the Basis of the Social Studies Program
Professor J. Granville Jensen, Rhode Island College of Education

AFTERNOON SESSION

Chairman: Dr. J. Russell Whitaker, George Peabody College for Teachers, Nashville, Tennessee
Secretary: Miss Edna E. Eisen, Kent State University, Kent, Ohio
The Place of Geography in the Social Studies
Dr. Harry Lathrop, Illinois State Normal University, Normal, Illinois
Educational Services of Geography in the Emerging World Community
Professor George J. Miller, Editor, *Journal of Geography*, State Teachers College, Mankato, Minnesota
Discussion Leader: Dr. Edwin H. Reeder, University of Illinois

OTHER TOPICS OF INTEREST

Other topics of special interest to geography teachers are:

A Canadian Estimate of United States Understanding of Canada
A Latin-American Estimate of United States Understanding of Latin-America
American Understanding of the Far East
The Soviet Union and Russian-American Relations
Economic Welfare in the Post-War World
Intercultural Relations
Selecting and Organizing State and Local Materials
Balance between Local Community and Study of Wider Areas (Middle Grades)

For further information address Merrill F. Hartshorn, National Council for the Social Studies, 1201 Sixteenth Street, N.W., Washington, D.C.

Hotel reservations should be made well in advance by writing directly to the Hotel Statler.

INTEREST-STIMULATING DEVICE

W. O. BLANCHARD
University of Illinois

TWENTY-FIVE FIGURES AND DATES OF GEOGRAPHICAL INTEREST

(Figures are approximate)

Opposite each of the following indicate its geographical significance:

1. 14.7 pounds .....
2. 32° F. .....
3. 23½° .....
4. 365¼ days .....
5. 30 inches .....
6. 69 miles .....
7. 24 hours .....
8. 25,000 miles .....
9. 212° F. .....
10. 0° C. .....
11. 100° C. .....
12. 93 million miles .....
13. 3.3° to 1000 feet .....
14. June 21st .....
15. 5.5° to 1000 feet .....
16. Dec. 22nd .....
17. 1 hour to 15° .....
18. 1:63360 .....
19. 28 days .....
20. 0° Lat. .....
21. 180° Lat. .....
22. 0° Long. .....
23. 63½° Lat. .....
24. Sept. 22nd .....
25. Mar. 21st .....

EDITORIAL NOTES AND NEWS

TREVOR LLOYD, professor of geography, Dartmouth College, has undertaken a wartime assignment for the Canadian government at Godthaab, Greenland. Study of Arctic regions is one of Professor Lloyd's special interests. He is preparing a report for the Canadian Institute of International Affairs on postwar development of northern Canada. Together with Dean E. Gordon Bill he shared in the formulation of plans for the recently announced Arctic Institute of North America. Mr. and Mrs. Lloyd and their daughter are being flown from Ottawa to Godthaab by the Royal Canadian Air Force.

The Pennsylvania Council of Geography Teachers is to be commended for the practical and inspiring articles and notes featured in the October, 1944, issue of the Council's official publication, *Geography Bulletin*. The Council recently sponsored a survey of geography courses taught in Pennsylvania. It reports that 40 per cent of the state's high schools either have geography or are interested in it, leaving 60 per cent with no geography. Mrs. Linnie B. James, is president of the Council, and Clara A. Meyers and Josephine Moyer are the editors of the *Bulletin*. Directly or indirectly affiliated with the State Council are a number of geography clubs which sponsor programs and exhibits of practical value. One of these clubs, The Geography Club of Western Pennsylvania, presented a program on High School Geography at the Western Pennsylvania Education Conference, held at Pittsburgh, October 12, 13, 14. O. E. Baker, University of Maryland, was the guest speaker. The Pennsylvania State Council plans to meet at Harrisburg, December 29, under the sponsorship of the Geography Round Table of the P.S.E.A.

The oil industry's quest for new producing areas has recently been directed to the Atlantic Coastal Plain. It has long been known that a thin wedge of sedimentary rock extends from the eastern slopes of the Appalachian Mountains and Piedmont Plateau and thickens thru the Coastal Plain and continental shelf. Leasing activity was stimulated by the discovery of oil last year in a deep Florida wildcat well. The leases involve many million acres of land but intensive investigation of structural conditions must await the end of the war or until the necessary manpower becomes available.

United States petroleum production has reached the staggering figure of 5 million barrels a day. When the war ends will civilian use supply a market for this great production? If not, postwar readjustments may become serious in such great producing areas as Texas. Or, will the markets be in areas outside the United States which have about 90 per cent of the world's population but only half the oil consumption of the United States?

Great Britain is getting at least 700,000 barrels of oil annually from an undisclosed area within the island, the exact location of which will not be disclosed until the end of the war. There are more than 200 wells, each equipped with a pump carefully concealed to blend in with the green landscape. Underground pipes carry the oil to rail tankers which take the oil to the refineries.